

Nurses as Advocates: Promoting Vaccination Compliance among High-Risk Populations in Tertiary Healthcare Settings

Thikrayat H. Al-Sayhati¹, Saja M. Althobaiti²

Health Affairs at the Ministry of National Guard

Abstract

Background: Vaccination compliance among high-risk populations remains a critical public health challenge. Nurses play a pivotal role in improving vaccination rates through education, advocacy, and tailored interventions.

Objective: This study evaluated the impact of nurse-led interventions on vaccination compliance in a tertiary hospital setting.

Methods: A mixed-methods approach was employed, incorporating retrospective analysis of vaccination records and qualitative interviews. The study assessed compliance rates for influenza, hepatitis B, and pneumococcal vaccines before and after implementing nurse-led interventions, including education sessions and reminder systems.

Results: Post-intervention compliance rates increased significantly for influenza (55% to 78%), hepatitis B (42% to 68%), and pneumococcal (47% to 73%) vaccines. Logistic regression analysis identified nurse-led education and reminder systems as key factors influencing compliance ($p < 0.001$). Qualitative data revealed themes such as vaccine hesitancy, trust in nurses, and accessibility challenges.

Conclusion: Nurse-led interventions effectively improve vaccination compliance among high-risk populations. These findings highlight the need for institutional support to sustain such initiatives and address systemic barriers.

Keywords: Vaccination compliance, nurse-led interventions, high-risk populations, vaccine hesitancy, tertiary hospital, public health.

Introduction

Vaccination is one of the most effective public health interventions to prevent the spread of infectious diseases, particularly among high-risk populations such as the elderly, immunocompromised individuals, and those with chronic illnesses (Stinchfield, 2008). However, achieving optimal vaccination coverage in these populations remains a significant challenge due to various barriers, including vaccine hesitancy, logistical constraints, and misinformation (Nyamathi et al., 2009).

Nurses play a pivotal role in promoting vaccination compliance due to their accessibility, trustworthiness, and frequent interactions with patients. Through education, advocacy, and direct administration of vaccines,

nurses are uniquely positioned to address misconceptions and encourage adherence to vaccination schedules (Vlahov et al., 2007). Nurse-led interventions, such as individualized counseling and community outreach programs, have been shown to improve vaccination rates among vulnerable groups, demonstrating the critical impact of nursing practice on public health outcomes (Bryant et al., 2004).

In high-risk settings, such as tertiary hospitals, the role of nurses extends beyond routine immunization efforts. They contribute to developing and implementing evidence-based strategies, such as reminder systems and expanded vaccination opportunities, to reduce vaccine-preventable diseases (Frenzel et al., 2016). These interventions not only enhance patient compliance but also strengthen the overall healthcare system's capacity to manage infectious disease outbreaks effectively (Zhang et al., 2011).

This research explores the multifaceted role of nurses in promoting vaccination compliance among high-risk populations, emphasizing evidence-based practices, barriers, and opportunities for improvement. Understanding the contributions of nursing in this critical area will inform future interventions and policy decisions, ensuring better health outcomes for at-risk individuals.

Literature Review

Vaccination compliance, particularly among high-risk populations, has been a persistent challenge in global healthcare systems. This section reviews the role of nurses in promoting vaccination, barriers to compliance, and evidence-based strategies that have proven effective in addressing these challenges.

1. The Role of Nurses in Promoting Vaccination

Nurses are at the forefront of healthcare delivery, particularly in vaccination programs, where they act as educators, advocates, and implementers of immunization policies. Stinchfield (2008) highlighted the pivotal role of nurses in improving vaccination rates through patient education, counseling, and advocacy. Nurses' frequent and trusted interactions with patients position them uniquely to dispel vaccine hesitancy and misinformation, especially among high-risk groups such as the elderly and immunocompromised individuals.

Nyamathi et al. (2009) demonstrated the effectiveness of nurse-managed programs in increasing vaccine adherence among homeless adults for hepatitis A and B vaccinations. These interventions included targeted education and tailored support, which significantly improved vaccine completion rates. Similarly, Frenzel et al. (2016) emphasized the impact of nurses in tertiary hospitals by linking increased healthcare worker vaccination to reduced nosocomial infections among cancer patients, showcasing the broader systemic benefits of nurse-led vaccination initiatives.

2. Barriers to Vaccination Compliance

Barriers to vaccination compliance are multifactorial, encompassing patient-specific, systemic, and logistical challenges. Vaccine hesitancy, driven by misinformation, fear of side effects, and cultural beliefs, remains a significant obstacle. Zhang et al. (2011) identified gaps in nurses' knowledge about vaccines and their risk perceptions, which can inadvertently influence patient compliance. Addressing these knowledge gaps through continuous professional education is critical to empowering nurses as effective vaccination advocates.

Another challenge lies in logistical barriers, such as limited access to healthcare services and missed vaccination opportunities. Vlahov et al. (2007) explored strategies to reach underserved populations, emphasizing the importance of community-based outreach and the role of nurses in bridging accessibility gaps. Additionally, Frenzel et al. (2016) noted the need for healthcare systems to support nurses through expanded vaccination opportunities, such as mobile clinics and extended immunization hours.

3. Evidence-Based Strategies for Enhancing Vaccination Compliance

Numerous evidence-based strategies have been proposed to enhance vaccination rates among high-risk populations. Nurse-led reminder systems and follow-up interventions have been shown to significantly improve compliance. Stinchfield (2008) discussed the success of multifaceted educational programs targeting both patients and healthcare providers. These programs included patient education campaigns, provider training, and the integration of vaccination reminders into electronic health records.

Bryant et al. (2004) focused on influenza vaccination rates among healthcare workers caring for pediatric patients, demonstrating that institutional support for nurses, including educational resources and vaccination mandates, increased compliance rates. Furthermore, Nyamathi et al. (2009) underscored the importance of tailoring interventions to the specific needs of high-risk groups, such as homeless individuals or those with chronic conditions.

The effectiveness of these strategies is often contingent on addressing vaccine hesitancy through culturally sensitive education and transparent communication. Zhang et al. (2011) suggested that involving nurses in policy formulation and public health campaigns can amplify their impact on patient compliance and trust.

4. Nurses as Advocates for Systemic Change

Nurses are also critical advocates for systemic changes to improve vaccination uptake. Frenzel et al. (2016) emphasized that nurses' involvement in developing immunization policies ensures that these policies are both practical and patient-centered. The literature suggests that empowering nurses through continuous professional development and leadership opportunities enhances their capacity to promote vaccination compliance effectively (Stinchfield, 2008).

Conclusion

The literature underscores the integral role of nurses in addressing vaccination challenges among high-risk populations. Through education, advocacy, and evidence-based interventions, nurses have demonstrated their ability to significantly improve vaccination compliance. However, ongoing efforts are required to address barriers such as vaccine hesitancy and logistical constraints. Future research should focus on leveraging nurses' roles in developing innovative strategies and policies to sustain high vaccination rates in vulnerable populations.

Methodology

This study utilized a mixed-methods approach, integrating both quantitative and qualitative data collection techniques, to evaluate the role of nurses in promoting vaccination compliance among high-risk populations in a tertiary hospital setting.

1. Study Design

A cross-sectional study design was employed to assess vaccination compliance rates and identify the impact of nurse-led interventions. The study included both retrospective analysis of vaccination records and prospective qualitative interviews with healthcare providers and patients.

2. Study Setting and Population

The study was conducted in a tertiary hospital. The hospital serves a diverse patient population, including high-risk groups such as immunocompromised patients, individuals with chronic illnesses, and the elderly. The study population comprised:

- **Patients:** Adults aged 18 and above, identified as part of high-risk groups based on hospital records.
- **Nurses:** Registered nurses involved in patient care and immunization programs.

Inclusion criteria for patients included:

- Diagnosed chronic conditions such as diabetes, cardiovascular diseases, or immunosuppressive disorders.
- A history of missed or delayed vaccinations.

Nurses included in the study were those actively participating in vaccination programs or providing care to high-risk patients.

3. Sampling

A stratified random sampling technique was used to select participants:

- **Patients:** 300 patients were randomly selected from vaccination records within a 12-month period.
- **Nurses:** 50 nurses were purposively sampled based on their involvement in immunization programs and willingness to participate in the study.

4. Data Collection

Quantitative Component

- **Vaccination Compliance Rates:** Retrospective data were extracted from the hospital's electronic health records, including patient demographics, vaccination history, and adherence rates for vaccines such as influenza, hepatitis B, and pneumococcal vaccines.
- **Intervention Effectiveness:** The impact of nurse-led interventions, such as education sessions and reminder systems, was assessed by comparing vaccination rates before and after the implementation of these interventions.

Qualitative Component

- **Semi-Structured Interviews:** Conducted with 20 nurses and 30 patients to explore barriers, facilitators, and perceptions related to vaccination compliance.

- **Focus Group Discussions:** Two focus groups (one with nurses and one with patients) were held to gain deeper insights into the effectiveness of nurse-led strategies and challenges encountered during implementation.

5. Data Analysis

Quantitative Data

Data were analyzed using SPSS:

- Descriptive statistics (mean, standard deviation) were used to summarize patient demographics and compliance rates.
- Chi-square tests were applied to examine associations between nurse-led interventions and vaccination compliance.
- Logistic regression was used to identify factors influencing compliance, including demographic variables and intervention types.

Qualitative Data

Thematic analysis was conducted using NVivo software. Transcripts from interviews and focus groups were coded to identify recurring themes, such as:

- Patient perceptions of nurse-led education.
- Challenges faced by nurses in promoting vaccination.
- Suggestions for improving compliance strategies.

6. Ethical Considerations

Ethical approval was obtained from the hospital's ethics committee. Informed consent was secured from all participants prior to their inclusion in the study. Confidentiality and anonymity were maintained by de-identifying patient and nurse data during analysis.

The findings of this study were shared with hospital administration through a comprehensive report. Additionally, a workshop was conducted to present recommendations for improving vaccination compliance, with a focus on scaling successful nurse-led interventions across other departments.

Findings

The findings are presented in two sections: quantitative results and qualitative insights. Quantitative data summarize the vaccination compliance rates and factors associated with compliance, while qualitative data explore themes and sub-themes from participant narratives.

1. Quantitative Findings

1.1 Vaccination Compliance Rates

Before and after implementing nurse-led interventions, vaccination compliance rates were analyzed across three key vaccines: influenza, hepatitis B, and pneumococcal vaccines.

Vaccine	Pre-Intervention Compliance (%)	Post-Intervention Compliance (%)	Increase (%)
Influenza	55%	78%	23%
Hepatitis B	42%	68%	26%
Pneumococcal	47%	73%	26%

1.2 Factors Influencing Compliance

Logistic regression analysis identified factors significantly associated with vaccination compliance.

Factor	Odds Ratio (95% CI)	P-Value
Nurse-led education sessions	2.6 (1.8–3.9)	<0.001
Use of reminder systems	3.1 (2.0–4.7)	<0.001
Patient age (>65 years)	1.5 (1.1–2.1)	0.005
Chronic illness presence	2.0 (1.4–2.9)	<0.001

1.3 Impact of Interventions

Chi-square analysis showed a significant association between nurse-led interventions and increased compliance across all three vaccine types ($p < 0.001$).

2. Qualitative Findings

Thematic analysis of interviews and focus groups revealed four primary themes with sub-themes. Direct participant quotes illustrate the findings.

Theme 1: Barriers to Vaccination Compliance

- **Sub-theme 1.1: Vaccine Hesitancy**
 - "I was worried about side effects, but the nurse explained everything clearly, and I felt reassured." (Patient 14)
 - "Many patients believe the myths they see online, and it takes time to change their mindset." (Nurse 5)
- **Sub-theme 1.2: Accessibility Challenges**
 - "I couldn't get vaccinated before because the clinic hours clashed with my work schedule." (Patient 21)
 - "Some patients live far away, and transportation is a big issue for them." (Nurse 8)

Theme 2: Effectiveness of Nurse-Led Interventions

- **Sub-theme 2.1: Education and Counseling**
 - "The nurse explained why the vaccine was important for me as a diabetic patient. That convinced me to get it." (Patient 7)
 - "Patients trust nurses, so when we take the time to educate them, they listen." (Nurse 3)
- **Sub-theme 2.2: Reminder Systems**

- *"I got a text message reminding me about my vaccine appointment, which was very helpful."* (Patient 18)
- *"The reminder system really reduced the number of missed appointments."* (Nurse 12)

Theme 3: Nurses' Challenges in Promoting Vaccination

- **Sub-theme 3.1: Workload Pressures**

- *"We're already stretched thin with regular duties, so adding vaccination drives can be overwhelming."* (Nurse 9)
- *"Sometimes, I wish there were more staff to help us manage vaccination schedules."* (Nurse 11)

- **Sub-theme 3.2: Addressing Misinformation**

- *"Patients come with so many false beliefs about vaccines that you have to spend extra time debunking myths."* (Nurse 2)

Theme 4: Patient Perceptions of Vaccination Programs

- **Sub-theme 4.1: Trust in Nurses**

- *"The nurse who spoke to me was so kind and knowledgeable. That made all the difference."* (Patient 16)
- *"I felt safe because the nurse took the time to answer all my questions."* (Patient 12)

- **Sub-theme 4.2: Convenience of Services**

- *"Offering vaccines during my regular check-up was very convenient."* (Patient 5)
- *"The outreach program in my neighborhood made it easy for me to get vaccinated."* (Patient 10)

The quantitative data demonstrate a significant improvement in vaccination compliance rates following nurse-led interventions. Qualitative findings further highlight the importance of patient education, reminder systems, and accessibility in achieving compliance. Barriers such as misinformation and workload pressures underline the need for ongoing support for nurses in vaccination initiatives.

Discussion

This study evaluated the role of nurses in promoting vaccination compliance among high-risk populations within a tertiary hospital setting. The findings indicate that nurse-led interventions, including education sessions and reminder systems, significantly improved vaccination rates for influenza, hepatitis B, and pneumococcal vaccines. These results highlight the critical role of nurses in addressing barriers to compliance and implementing evidence-based strategies to enhance vaccine uptake.

1. Improved Vaccination Compliance

The quantitative data demonstrate a notable increase in vaccination compliance rates post-intervention, with a 23–26% improvement across the three vaccine types. These findings align with previous studies that underscore the effectiveness of nurse-led initiatives in improving adherence to immunization schedules (Stinchfield, 2008; Nyamathi et al., 2009). The logistic regression analysis further supports the hypothesis that targeted nurse interventions, such as education and reminders, significantly influence compliance, particularly among older adults and patients with chronic conditions.

2. Barriers to Vaccination

The qualitative findings reveal key barriers to vaccination compliance, including vaccine hesitancy, accessibility issues, and logistical challenges. Consistent with prior research, vaccine hesitancy was attributed to misinformation and fear of side effects (Vlahov et al., 2007). Nurses reported that addressing these concerns required time-intensive education and reassurance, emphasizing the need for continued professional development to equip nurses with the tools to counter misinformation effectively (Zhang et al., 2011).

Accessibility challenges, such as transportation issues and inconvenient clinic hours, were also highlighted as significant barriers. These findings suggest that healthcare systems must prioritize making vaccination services more accessible, potentially through mobile clinics or extended operating hours, to cater to high-risk populations.

3. Effectiveness of Nurse-Led Interventions

The success of nurse-led interventions in this study demonstrates the value of integrating education, counseling, and reminder systems into routine nursing practice. Education sessions personalized to patient needs were particularly effective in dispelling myths and building trust, a finding supported by Bryant et al. (2004). Similarly, reminder systems were shown to significantly reduce missed appointments, a strategy that has been widely recommended in vaccination campaigns (Frenzel et al., 2016).

Patients' trust in nurses was a recurring theme, underscoring the importance of the nurse-patient relationship in achieving vaccination compliance. The qualitative data showed that patients perceived nurses as knowledgeable and approachable, which enhanced their willingness to receive vaccines. This trust is a critical factor that healthcare systems should leverage to promote immunization among hesitant populations.

4. Challenges Faced by Nurses

Despite their success, nurses reported challenges in implementing vaccination programs, including high workloads and the need to address persistent misinformation. These findings echo those of prior studies, which have identified nurse workload as a limiting factor in delivering comprehensive care (Nyamathi et al., 2009). Addressing these challenges requires institutional support, such as adequate staffing and resources, to enable nurses to balance routine responsibilities with vaccination initiatives effectively.

The issue of misinformation emerged as a particularly complex challenge, with nurses spending significant time correcting false beliefs. This highlights the need for healthcare systems to invest in public education campaigns that complement nurse-led efforts, reducing the burden on individual providers to address these issues.

5. Implications for Practice and Policy

The findings have several implications for practice and policy. First, nurse-led interventions should be recognized and institutionalized as a critical component of vaccination programs. This includes providing nurses with training in communication strategies to address vaccine hesitancy effectively. Second, healthcare facilities must prioritize accessibility by integrating vaccination services into regular patient care and exploring innovative solutions, such as mobile clinics and extended hours. Third, addressing systemic

challenges, such as workload pressures and resource limitations, is essential to sustaining the success of nurse-led initiatives.

Finally, policy-makers should consider involving nurses in the design and implementation of immunization policies. As frontline healthcare providers, nurses have invaluable insights into patient behavior and system-level barriers, making their input crucial for developing practical and patient-centered strategies.

6. Strengths and Limitations

A key strength of this study is its mixed-methods approach, which provides a comprehensive understanding of both quantitative outcomes and qualitative experiences. However, the study is limited by its single-center design, which may restrict the generalizability of the findings. Future research should explore the scalability of nurse-led interventions in diverse healthcare settings and assess their long-term impact on vaccination rates.

Conclusion

This study underscores the critical role of nurses in promoting vaccination compliance among high-risk populations. By addressing barriers, implementing effective interventions, and building trust, nurses significantly enhance vaccine uptake. However, ongoing support, training, and resources are essential to sustain these efforts. These findings provide a strong foundation for scaling nurse-led vaccination programs and informing policies aimed at improving public health outcomes.

References

1. Bryant, K. A., Stover, B., Cain, L., & Levine, G. L. (2004). Improving influenza immunization rates among healthcare workers caring for high-risk pediatric patients. *Infection Control & Hospital Epidemiology*, 25(11), 923-928.
2. Frenzel, E., Chemaly, R. F., Ariza-Heredia, E., Jiang, Y., Shah, D. P., Thomas, G., ... & Raad, I. (2016). Association of increased influenza vaccination in health care workers with a reduction in nosocomial influenza infections in cancer patients. *American journal of infection control*, 44(9), 1016-1021.
3. Nyamathi, A., Liu, Y., Marfisee, M., Shoptaw, S., et al. (2009). Effects of a nurse-managed program on hepatitis A and B vaccine completion among homeless adults. *Nursing Research*, 58(1), 13-22.
4. Stinchfield, P. K. (2008). Practice-proven interventions to increase vaccination rates and broaden the immunization season. *The American Journal of Medicine*, 121(7), S11-S20.
5. Vlahov, D., Coady, M. H., Ompad, D. C., & Galea, S. (2007). Strategies for improving influenza immunization rates among hard-to-reach populations. *Journal of Urban Health*, 84(4), 615-625.
6. Zhang, J., While, A. E., & Norman, I. J. (2011). Nurses' knowledge and risk perception towards seasonal influenza and vaccination and their vaccination behaviours: A cross-sectional survey. *International Journal of Nursing Studies*, 48(10), 1281-1289.